

What is claimed is:

1. A method for generating a periodic circular structure in
5 a basic support material comprising the steps of:

a) generating a number of diffraction masks such that each
mask comprises at least one transmission diffraction
gratings having at least one of a different periodic
concentric circular pattern, spiral-like periodic
10 pattern and periodic radial spoke pattern;

b) positioning at least one of said diffraction masks
simultaneously or successively in a certain distance of
the basic support material to be patterned, the distance
being mask dependent;

15 c) exposing said basic support material by directing light
beams through each of the diffraction masks; and

d) interfering the different light beams diffracted by the
gratings on each mask in order to generate coincident
light intensity patterns on the surface of the basic
20 support material.

2. The method according to claim 1, wherein the step of
exposing further comprises the steps of:

- generating exposure by directing light through a
25 transmission diffraction mask having a periodic circular
interference mask pattern so as to generate exposure of
circular tracks on the basic support material; and

- after said step of generating exposure further generating
exposure using a transmission diffraction mask having a
30 spiral extending interference mask pattern or a radial
extending interference mask pattern thereby generating a
circumferential partitioning of said generated circular
tracks.

35 3. The method according to claim 1, wherein the step of
exposing further comprises the steps of:

generating said exposure using a first transmission diffraction mask having a combined circular and spiral interference mask pattern so as to generate a first spiral track pattern on the basic support material; and

5 after said step of generating said exposure further generating said exposure using a second transmission diffraction mask having a combined circular and spiral extending interference mask pattern wherein said spiral component is oriented in an opposite direction to the first
10 transmission diffraction mask, the second transmission effecting a partitioning of said generated first spiral track pattern by intersecting said first and said second spiral track pattern.

15 4. The method according to claim 1, wherein the diffraction masks are one of an absorption and phase shifting mask.

20 5. The method according to claim 1, wherein the light source generates light having a circular polarization or a linear polarization which varies with time.

25 6. The method according to claim 1, wherein the light source comprises a wavelength between 5 and 500 nanometers.

7. The method according to claim 6, further comprising the step of using an immersion lithography process for decreasing feature sizes, the lithography process having a refractive index larger than 1 and disposed between the transmission
30 diffraction mask and the basic support material.

8. The method according to claim 1, wherein the partitioned circular periodic structure comprises cells having a length to width ratio larger than 1.

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9. The method according to claim 1, wherein the basic support material comprises a layer for magnetic bit cells for a magnetic storage device.